WHAT IS CLAIMED IS:

1. A digital subscriber line modem, comprising:

a first transceiver, adapted to be coupled to a first communications facility, for modulating and transmitting signals in a first frequency band over the first communications facility, and for receiving and demodulating signals in a second frequency band from the first communications facility, wherein the data rate of the signals received by the first transceiver is significantly higher than that of the signals transmitted by the first transceiver;

a second transceiver, adapted to be coupled to a second communications facility, for modulating and transmitting signals in a third frequency band over the second communications facility, and for receiving and demodulating signals in a fourth frequency band from the second communications facility, wherein the data rate of the signals transmitted by the second transceiver is significantly higher than that of the signals received by the second transceiver;

a host interface coupled to the first and second transceivers, for outputting the demodulated received signals from the first and second transceivers, and for receiving the signals to be modulated and transmitted by the first and second transceivers.

2. The modem of claim 1, wherein the first and second communications facilities comprise first and second twisted-wire pairs.

3. The modem of claim 2, wherein the first and fourth frequency bands are substantially identical.

4. The modem of claim 3, wherein the second and third frequency bands are substantially identical.

5. The modem of claim 2, wherein the first and second frequency bands do not overlap;

and wherein the second frequency band covers higher frequencies than the first frequency band.

6. The modem of claim 5, wherein the third and fourth frequency bands do not overlap;

and wherein the third frequency band covers higher frequencies than the fourth frequency band.

7. The modem of claim 1, wherein each of the first and second transceivers comprise:

a hybrid circuit, coupled to the communications facility;

a line driver and receiver circuit, coupled to the hybrid circuit;

a coder/decoder, coupled to the line driver and receiver circuit; and

a digital transceiver, coupled between the coder/decoder and the host interface.

8. The modem of claim 7, wherein the digital transceivers of the first and second transceivers comprise a digital signal processor.

9. A digital subscriber line communications system, comprising:

a communications facility, comprising:

a first twisted-wire pair;

a second twisted-wire pair;

a central office modem, comprising:

a first transceiver, for receiving and demodulating signals in a first frequency bandover the first twisted-wire pair, and for modulating and transmitting signals in a second frequency band over the first twisted-wire pair, wherein the data rate of the signals received by the first transceiver is significantly lower than that of the signals transmitted by the first transceiver;

a second transceiver, for receiving and demodulating signals in a third frequency band over the second twisted-wire pair, and for modulating and transmitting signals in a fourth frequency band over the second twisted-wire pair, wherein the data rate of the signals received by the second transceiver is significantly higher than that of the signals transmitted by the second transceiver;

a network interface, for interfacing the first and second transceivers to a network;

a customer premises equipment modem associated with a customer, comprising:

a third transceiver, for modulating and transmitting signals in the first frequency band over the first twisted-wire pair, and for receiving and demodulating signals in the second frequency band over the first twisted-wire pair, wherein the data rate of the signals received by the third transceiver is significantly higher than that of the signals transmitted by the third transceiver;

a fourth transceiver, for modulating and transmitting signals in the third frequency band over the second twisted-wire pair, and for receiving and demodulating signals in the fourth frequency band over the second twisted-wire pair, wherein the data rate of the signals transmitted by the second transceiver is significantly higher than that of the signals received by the second transceiver; and

a host interface, for interfacing the third and fourth transceivers to a network.

10. The system of claim 9, further comprising:

a communications facility, coupled to the first and second transceivers of the central office modem; and

a concentrator, coupled to the first and second twisted-wire pairs and to the communications facility.

11. The system of claim 10, wherein the communications facility comprises a fiber optic facility.

12. The system of claim 11, wherein the concentrator comprises:

analog-to-digital converter circuitry, for converting analog signals received over the first and second twisted-wire pairs to digital signals; and

digital-to-analog converter circuitry, for converting digital signals into analog signals for transmission over the first and second twisted-wire pairs.

13. The system of claim 12, wherein the concentrator further comprises:

modulator and demodulator circuitry, for modulating and demodulating signals communicated between the communications facility and the first and second twisted-wire pairs, so that the signals communicated over the first and second twisted-wire pairs are modulated according to a discrete multi-tone modulation.

14. The system of claim 10, wherein the communications facility comprises wire conductors.

15. The system of claim 9, wherein the first and fourth frequency bands are substantially identical.

16. The system of claim 15, wherein the second and third frequency bands are substantially identical.

17. The system of claim 9, wherein the first and second frequency bands do not overlap;

and wherein the second frequency band covers higher frequencies than the first frequency band.

18. The system of claim 17, wherein the third and fourth frequency bands do not overlap;

and wherein the third frequency band covers higher frequencies than the fourth frequency band.

19. The system of claim 10, wherein the concentrator comprises:

a concentrator function, coupled to the first and second twisted-wire pairs and to the communications facility; and

a central processing unit, coupled to the concentrator function, for assigning the first and second twisted-wire pairs to a communications service provider associated with the customer serviced by the first and second twisted-wire pairs.

20. The system of claim 9, wherein the first and second twisted-wire pairs are disposed within a common sheath.

21. A method of communicating digital data over first and second twisted-wire pairs, comprising:

modulating digital data over a plurality of subchannels within a first frequency band to produce a first signal stream;

transmitting the first signal stream over a first twisted-wire pair;

receiving a second signal stream over the first twisted-wire pair;

demodulating digital data from the second signal stream, the demodulated digital data corresponding to a plurality of subchannels within a second frequency band;

wherein the data rate of the digital data demodulated from the second signal stream is substantially higher than that of the digital data modulated over the plurality of subchannels within the first frequency band;

modulating digital data over a plurality of subchannels within a third frequency band to produce a third signal stream;

transmitting the third signal stream over a second twisted-wire pair;

receiving a fourth signal stream over the second twisted-wire pair;

demodulating digital data from the fourth signal stream, the demodulated digital data corresponding to a plurality of subchannels within a fourth frequency band;

wherein the data rate of the digital data demodulated from the fourth signal stream is substantially less than that of the digital data modulated over the plurality of subchannels within the third frequency band; and

outputting the demodulated digital data from the second and fourth signal streams to a destination.

22. The method of claim 21, wherein the first and fourth frequency bands are substantially identical.

23. The method of claim 22, wherein the second and third frequency bands are substantially identical.

24. The method of claim 21, wherein the first and second frequency bands do not overlap;

and wherein the second frequency band covers higher frequencies than the first frequency band.

25. The system of claim 24, wherein the third and fourth frequency bands do not overlap;

and wherein the third frequency band covers higher frequencies than the fourth frequency band.

26. A digital subscriber line communications system, comprising:

a communications facility comprising a twisted-wire pair;

a central office modem, comprising:

a CO transceiver for receiving and demodulating signals in a first frequency band over the communications facility, and for modulating and transmitting signals in a second frequency band over the communications facility, wherein the data rate of the signals received by the CO transceiver is significantly higher than that of the signals transmitted by the CO transceiver;

a network interface, for interfacing the CO transceiver to a network; and

a customer premises equipment modem, comprising:

a CPE transceiver, coupled to the twisted-wire pair, for modulating and transmitting signals in the first frequency band over the twisted-wire pair, and for receiving and demodulating signals in the second frequency band over the twisted-wire pair, wherein the data rate of the signals transmitted by the CPE transceiver is significantly higher than that of the signals received by the CPE transceiver;

a host interface, for interfacing the CPE transceiver to a network.

* * * * *